

Investigation of VI at the Kachina Joray Facility within Motorola 52nd St Superfund Site

Background and Summary of
Preliminary Results

CIG - March 2011

SEPTEMBER 2007 TCE CONCENTRATION CONTOURS
HYDROSTRATIGRAPHIC SUBUNIT B







GROUNDWATER WELLS

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- [illegible]

OTHER FEATURES

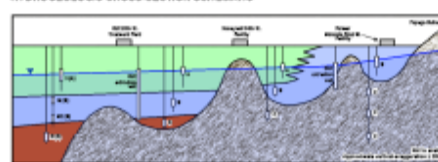
-  Null hypothesis
 H_0 is rejected (correct decision or error)
 Acceptance decision of H_0 (correct decision or error)
 Error

TCE CONCENTRATIONS

- 0-10 mph ● 101-150 mph
● 10-20 mph ● 151-200 mph
● 20-30 mph ● 201-250 mph
● 30-40 mph ● 251-300 mph

HYDROGEOLOGIC CROSS-SECTION SCHEMATIC

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EXPLANATION OF HYDROSTRATIGRAPHIC UNITS (HSU's)

- A. **Ball River Drift Deposits:** Rounded gravel, cobbles, and boulders in a sandy matrix with minor silt and clay.
- B. **Upper River Pit Deposits:** Unstratified fine and coarse grained to consolidated sediments.
 - Fine grained beds are typically sandy silt with clay.
 - Coarse grained beds are sand-rich rounded pebbles, gravel, cobbles, and boulder amounts of silt and clay.
- C. **Lower River Pit Deposits:** Predominantly fine-grained unconsolidated sediments with coarse-grained interbeds.
 - Fine grained beds are typically sandy silt with clay.
 - Coarse grained beds are sand-rich rounded pebbles and gravel, with boulder amounts of cobbles, silt, and clay.
- D. **Base of Unstratified, River Pit Deposits:** Sand-rich sedimentary and volcanic rocks (igneous-Cambrian metamorphic) and igneous rocks.

...discussant: to right.

- [illegible]

History of “Kachina Joray”

- Original facility owned by Joray Corporation and called “Kachina Testing Laboratories” 1980 – 1999
 - Aerospace materials testing and cleaning semiconductor industry tools
- Sold aerospace business to employees - now called it “Kachina Technical Services and Processes”
 - This group was in operation from 2000 – 2004
- Current business at site (Semiray) - similar testing work but does not use chlorinated solvents

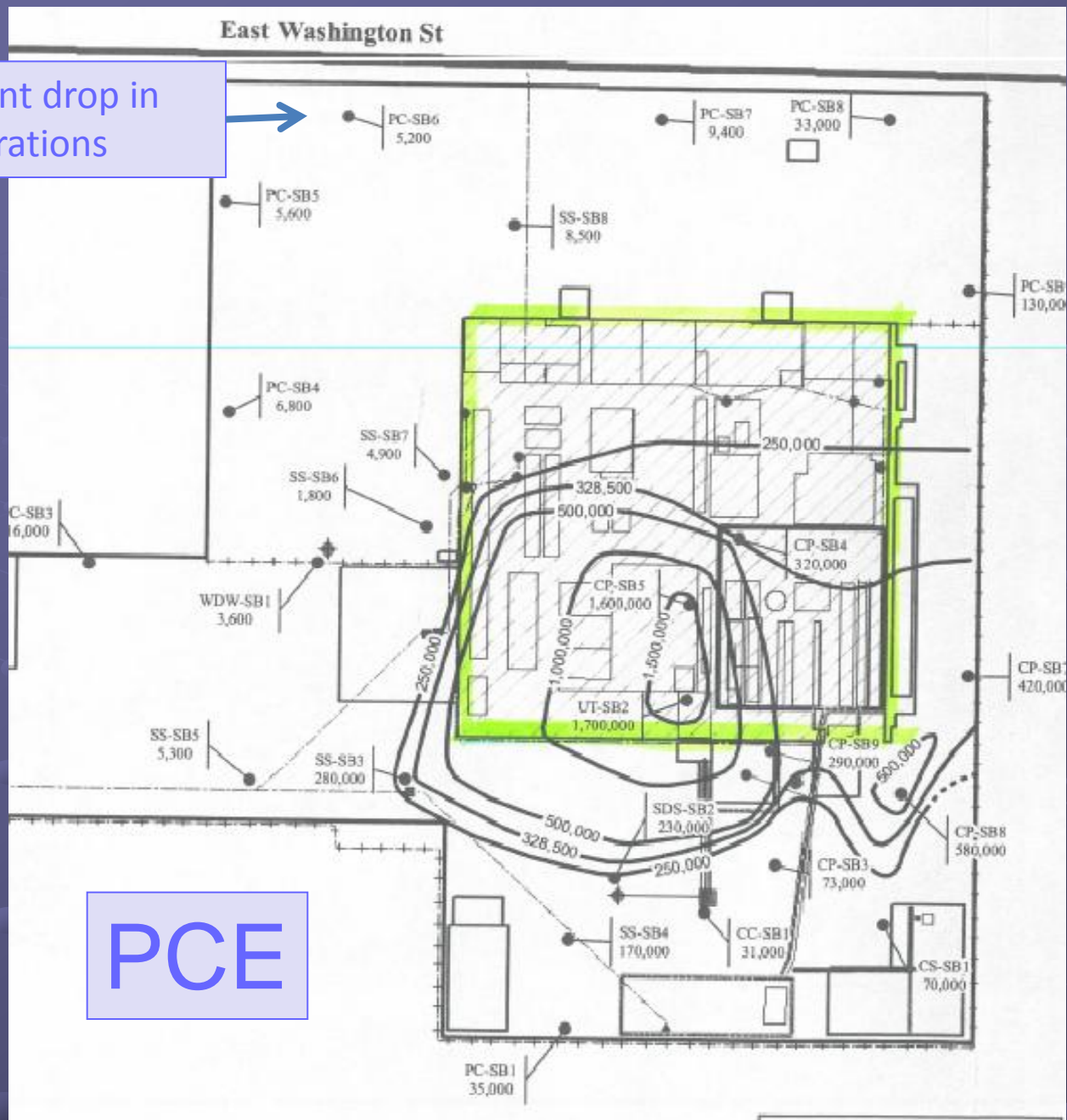
Draft Focused Remedial Investigation for Kachina Joray (Oct 2010)

- Atypical VI characteristics for M52
- No alluvial groundwater underneath facility
 - Bedrock only
- Soil gas on property far higher than expected based M52 groundwater data
- Principal COC was PCE (not TCE as is typical for rest of M52 site)
- PCE SGHHSL lower than for TCE:
 - PCE: 180 ug/m³
 - TCE: 520 ug/m³

Very High PCE in Soil Gas

- Highest concentration of soil gas for PCE is 17 million ug/m³ found 25 feet beneath ground surface
 - PCE Soil gas screening level is 180 ug/m³
- 9.4 million ug/m³ PCE found 10 feet beneath concrete floor at facility
 - It appears that the trend is increasing concentration with depth underneath facility
 - Due to shallow bedrock, source may be in fractures beneath property

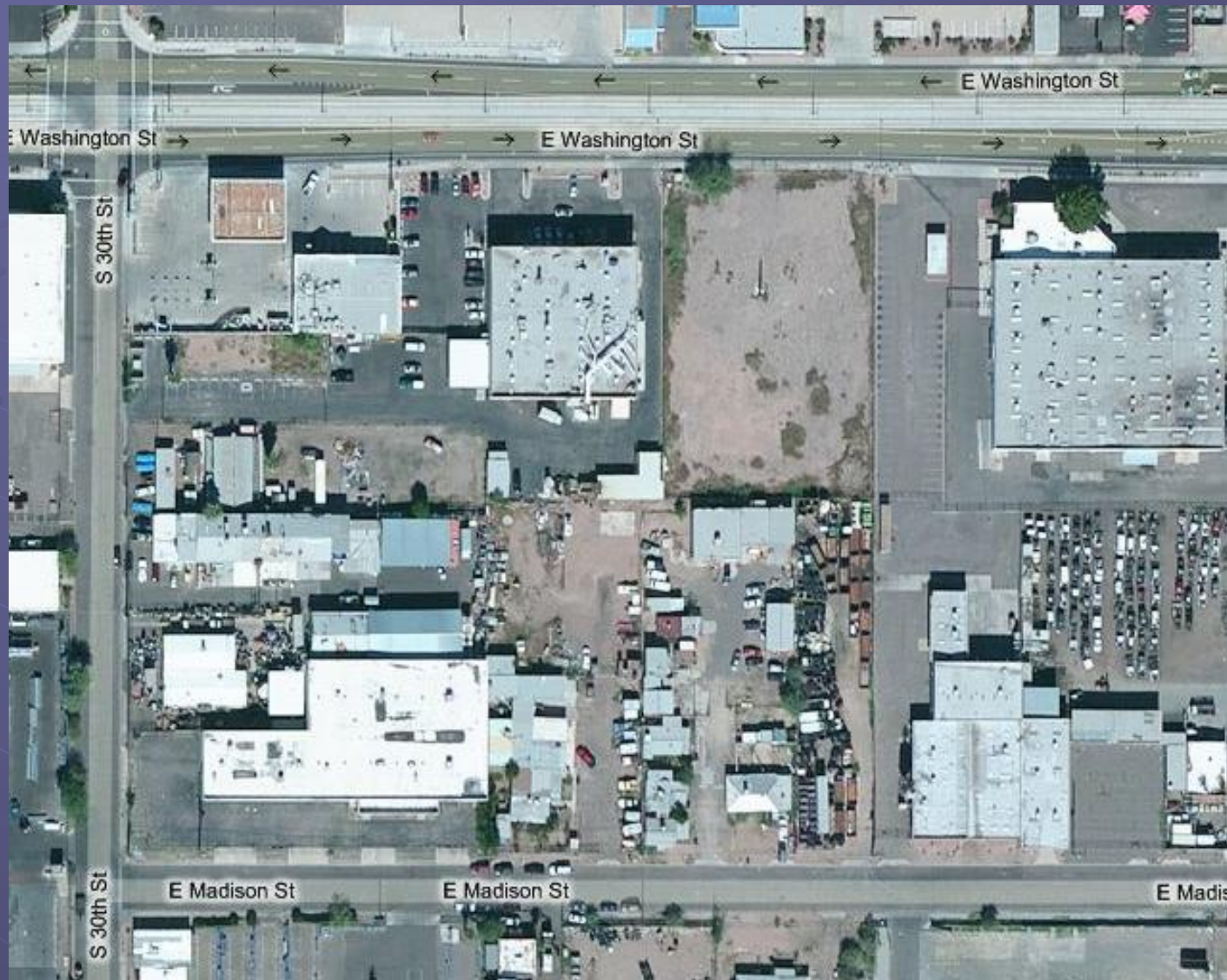
Significant drop in concentrations



More data lead EPA to assess potential risk in greater detail

- Seeing high concentrations resulted in looking closer for potential residents
- Google Earth identified small isolated community immediately adjacent
 - First glance: properties looked like auto repair or light industry
 - Zooming in and using Street view resulted in identifying possible houses
 - Driving by area and seeing children's toys increased priority level

Close Inspection: small neighborhood behind facility



Using EPA Emergency Response resources to expedite evaluation of indoor air pathway

- 35,000 ug/m³ at property fence line prompted indoor air sampling
 - Decision was made to evaluate potential impact to residents first
 - Multiple lines of evidence – simultaneous:
 - sub slab soil gas,
 - indoor air, and
 - ambient air
 - Samples were taken Feb 17 – 18

Summary Results - Off Property

- Soil vapor contamination has moved off Kachina Joray property - detected in some sub-slab samples (mainly PCE)
- No evidence of vapor intrusion into homes
 - Indoor air essentially same as ambient and/or no sub-slab PCE detected
- Some VI likely at commercial buildings but predicted IA levels indicate minimal risk
 - Sub-slab only, no IA sampling b/c of chemicals, materials used by businesses

Second step - assessing the vapor intrusion potential at KJ building

- PRP had draft indoor air work plan but stopped work in Sept 2010
 - EPA walk through (Fall 2010) identified areas for sampling
 - Private offices were identified as a priority
 - Current company compliant with access for indoor air samples
 - Indoor air only – no sub-slab

Summary of Results for Building

- Vapor intrusion is occurring in the building
 - mostly PCE
- Indoor air PCE levels are elevated, but do not require emergency response
- EPA working with the property owner, facility operator and ADEQ to identify appropriate actions to decrease risks for long-term (career-length) exposures
- More soil gas data will be needed to fully characterize the site

Lessons learned

- If near the source area, keep an open mind on the potential direction of soil vapors
 - Vapor migration pathway may differ from direction of groundwater flow
- Assess industrial areas carefully for adjacent residents
- Be ready to follow-up on finding large exceedances of soil gas screening levels